<u>AMENDMENTS TO THE CLAIMS</u>

This listing of claims will replace all prior versions and listings of claims in the application;

--1. (Currently Amended) An automatic gain adjustment device of a feedback control system ~~which~~ <u>that</u> uses a phase difference between an output signal obtained from a controlled object and an input signal while controlling the object based on the input signal, the automatic gain adjustment device comprising

phase shifting means[[,]] connected to an input stage of the feedback control system[[,]] for shifting a phase of the input signal, wherein

a phase shift amount of the phase shifting means is set ~~such~~ <u>so</u> that a frequency of the input signal to be supplied to a closed loop coincides with a crossover frequency at which an open loop gain ~~forming~~ <u>of</u> the feedback control system becomes 0 dB.

--2. (Currently Amended) The automatic gain adjustment device according to claim 1, further comprising:

a multiplier for multiplying the input signal and the output signal obtained from the controlled object; and

an integrator for integrating ~~multiplying~~ <u>product</u> results of the multiplier, wherein

the open loop gain is converged to 0 dB by adjusting a

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gain of the feedback control system based on a sign of an output value of the integrator.

--3. (Currently Amended) The automatic gain adjustment device according to claim 1, wherein

the open loop gain is converged to 0 dB using a bisection method.

--4. (Currently Amended) An automatic gain adjustment method for a feedback control system, which that uses a phase difference between an output signal obtained from a controlled object and an input signal while controlling the object based on the input signal, the automatic gain adjustment method comprising the steps of:

setting a phase shift amount such so that a frequency of the input signal to be supplied to a closed loop coincides with a crossover frequency at which an open loop gain forming of the feedback control system becomes 0 dB; and

shifting a phase of the input signal based on the phase shift amount set in said step of setting.

--5. (Currently Amended) The automatic gain adjustment method according to claim 4, further comprising the steps of:

multiplying the input signal and the output signal obtained from the controlled object;

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integrating results of the ~~multiplication~~ <u>step of multiplying</u>; and

converging the open loop gain to 0 dB by adjusting a gain of the feedback control system based on a sign of an output value that has been integrated <u>in the step of integrating</u>.

--6. (Currently Amended) The automatic gain adjustment method according to claim 4, wherein

the open loop gain is converged to 0 dB using <u>a</u> bisection method.